Thinking about Thinking: How young children develop theory of mind

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The bulk of the content below comes from articles in a special issue of Topics in Language Disorders, Vol. 34, No. 4, which deals exclusively with theory of mind.

"The most successful politician is he who says what the people are thinking most often in the loudest voice." — Theodore Roosevelt

What Roosevelt was getting at is the importance of being able to understand and be sensitive to others' thoughts and perspectives. This ability allows us to connect with others and, in the case of a politician, allows his constituents to connect with him. Having an understanding others' thoughts and feelings is referred to as one's "theory of mind". Theory of mind involves the "explicit understanding of how human behaviour is governed by mental states of belief, intention, memory, and desire" (Peterson, Wellman, & Slaughter, 2012, p. 469). In *TalkAbility* (Sussman, 2006), we refer to this ability as "tuning-in" to others.

Those of you who work with children with autism are probably not strangers to the topic of theory of mind. However, difficulties with theory of mind are also thought to be associated with the social communication problems seen in children who:

- have language impairment
- have attention-deficit/hyperactivity disorder
- have traumatic brain injury
- have some behavioural and psychiatric conditions
- are hard of hearing and learn sign language belatedly at school, as they have hearing parents who do not sign (their early environment can be considered linguistically deprived)

(Westby & Robinson, 2014; Peterson, Wellman, & Liu, 2005)

It's not surprising that children with a variety of communication challenges have difficulty with theory of mind as researchers have found evidence for a strong connection between language and theory of mind.

The language-theory of mind connection

There are three theories regarding the connection between language development and theory of mind, all with empirical evidence. It is likely that these theories are all "facets of the same general claim that language is an integral tool for learning about our own and other minds" (de Villiers & de Villiers, 2014, p. 315). The three theories about the nature of this connection are:

- children acquire labels for mental states when parents put their child's feelings and thoughts into words (e.g. "Do you want more crackers?" or "Did you hurt your foot?")
- participation in conversation exposes a child to people's different perspectives, attitudes, and beliefs because every conversation is a window into others' beliefs and desires
- a child's mastery of grammar (longer sentences as well as verbs such as "want", "think", "know") allows the child to express different perspectives, and this allows the child to reason about others' actions and behaviour.

Due to the language-theory of mind connection, it behooves those of us who work with young children with language and social communication challenges to understand the developmental course of theory of mind and intervention strategies to promote its development.

Dimensions of theory of mind

Until recently, researchers believed that theory of mind was a unitary construct - the ability to think about the thoughts and emotions of oneself and others. However, in the past fifteen years, neuroscientists have discovered that there are several dimensions of theory of mind and that each dimension has a different neurological underpinning:

- cognitive theory of mind – thinking about thoughts, knowledge, beliefs, and intentions
- affective theory of mind – thinking about and experiencing emotions
- interpersonal theory of mind – thinking about the thoughts and emotions of others
- intrapersonal theory of mind – thinking about one's own thoughts and emotions

(Westby et al, 2014)

Researchers have noted that children from low socioeconomic backgrounds have better interpersonal than intrapersonal theory of mind, but children with autism spectrum disorders have better intrapersonal than interpersonal theory of mind (Westby et al, 2014). While it would be ideal if all of these dimensions were considered when assessing an individual's theory of mind, currently there are no standardized tools available to assess these separate dimensions. However, having a good understanding of the developmental course of theory of mind can help clinicians when evaluating this area.

How theory of mind develops

Just like other cognitive skills, theory of mind develops in a predictable, sequential pattern in typical development. Most discussions of theory of mind development begin with the skills children acquire between ages four and five. However, there are many skills necessary for theory of mind to develop that emerge in infancy. The information that follows comes from the work of Westby et al (2014) and de Villiers et al (2014).

Pre-theory of mind

If you work with young children with communication difficulties, you may think that you've never had an opportunity to work on theory of mind as there have been so many other skills to work on first. But as you read below, you will realize that you may have been doing more to promote the development of theory of mind that you thought as many pre-theory of mind skills are common targets in our early communication intervention.

The skills involved with pre-theory of mind can be broken down into two sub-stages:

- **Engagement** - during this stage, children learn to engage with others and maintain interactions by responding to and initiating joint attention:
  o birth - 8 months: babies learn to share the emotions of their caregivers and mirror their expressions. This represents the beginnings of affective theory of mind.
  o 8 - 12 months: babies learn to use joint attention to reference objects for requests or to initiate social interaction. At this stage, children understand the effect of their behaviour on others, and how to use others' reactions to resolve uncertainty and to determine the emotional meaning of unfamiliar people or objects. They know how to recognize if others are fearful, angry, or happy and demonstrate this by either moving away from or closer to individuals.

- **Sense of self** – between 18 months and 4 years, children realize that they are separate from others and might have different likes and dislikes. At this stage children also start pretending. Both pretending and a sense of self involve cognitive intrapersonal theory of mind because the child needs to be able to reflect on his own appearance and behaviour:
  - 18 months: children begin to understand that other people might have likes that are different from their own, and that people will strive to get the things they want. Children also begin to pretend on themselves about everyday themes with very concrete props.
  - 18 months - 2 years: words that represent emotion such as "happy", "sad", "mad", and "scared" emerge. Children recognize distress in others and attempt to comfort them.
  - 3 – 3 ½ years: children understand that imaginary objects are different from real objects. They learn that different people can see different things, and that people know about things that they see (seeing something happen means that you know about it). Children learn that people's actions can be determined by their intentions and desires. They begin to display self-conscious emotions such as embarrassment, pride, shame, and guilt, and can understand the causes and consequences of emotions (e.g. If I throw my toy, Mommy will be mad).
  - 4 years: children pretend about less familiar, more abstract themes and roles with dolls, stuffed animals, or no props at all

First-order theory of mind

First-order theory of mind involves reflecting on what someone is thinking or feeling, and emerges in typically-developing children between the ages of four and five. The developmental progression of first order theory of mind was first identified by Wellman and Liu (2004): (the name of the stage as it is called in *TalkAbility™* is listed in parenthesis):

- **Diverse desires** ("*Understanding Wanting*") – different people want different things and, to get what they want, people act in different ways
- **Diverse beliefs** ("*Understanding Thinking*") – different people have different, but potentially true, beliefs about the same thing. People's actions are based on what they think is going to happen.
- **Knowledge access** ("*Understanding that seeing leads to knowing*") – not seeing leads to not knowing. If someone hasn't seen something, they will need extra information to understand.
- **False belief** ("*Understanding false beliefs*") – sometimes people believe things that are not true, and they act according to their beliefs, not according to what is really

true. A classic task for assessing false beliefs is the "Sally-Anne task", in which two dolls are used to re-enact the following scenario: Sally takes a marble and hides it in her basket. She then leaves, and while she is gone Anne enters and takes the marble out of Sally's basket and puts it in her own box. Sally is then reintroduced and the child is asked: "Where will Sally look for her marble?". The correct answer (indicating knowledge of false beliefs) is that Sally will look in her own basket.

- **Hidden emotion** ("*Understanding hidden feelings*") – people can feel a different emotion from the one they display (Peterson et al, 2012)

Research conducted with children with autism has shown that this population develops the first three stages of first-order theory of mind in the same order as typically-developing children, but the last two stages are reversed in sequence (Kimbi, 2014):

- Diverse desires
- Diverse beliefs
- Knowledge access
- Hidden emotion
- False belief

Second-order theory of mind

Second-order theory of mind involves predicting what one person thinks or feels about what another person is thinking or feeling (Westby et al, 2014). This type of thinking involves multiple embeddings (e.g. Sue wondered if Tim knew that she believed what Amy said), and an understanding of lies, sarcasm, figurative language, and social faux pas (saying something that causes unintended harm) (Westby et al, 2014). Children acquire this level of understanding between the ages of six to ten. Some argue that theory of mind development continues over a lifetime as one accumulates more experience with people and their behaviour (Miller, 2012; de Villiers et al, 2014).

The impact of theory of mind

The importance of theory of mind cannot be underestimated, as "effective and appropriate social communication/pragmatic language skills require a communicator to have a theory of mind" (Westby et al, 2014, p. 362). Theory of mind enables one to have meaningful conversations and to consider the listener's perspective. Besides communication, deficits in theory of mind also impact a variety of other domains (Kimbi, 2014):

- **Symbolic play** – pretending involves parallel processing, which involves holding two opposing thoughts in one's mind (e.g. holding a block up to one's ear can be a pretend telephone, but it's also still just a block). Furthermore, pretending involves

understanding and re-enacting others' perspectives (e.g. I am pretending to be a doctor, so I can't do things I would normally do. I need to do and say things that a doctor would do).

- **Deception** – telling a lie or covering up a misdeed involves intentionally instilling a false belief in the other person's mind
- **Autobiographical memories** – these are individual memories of single events, and they are needed in order to understand social events and others' mental states related to social events. Individuals with autism have been found to generate fewer autobiographical memories and it is thought that theory of mind deficits are related to autobiographical memory difficulties.
- **Event schemes** – this is generalized knowledge about what happens during common real-life events. Individuals with autism who have theory of mind deficits also have significant impairments in describing common event schemes.
- **Reading comprehension** – theory of mind is needed for readers to make inferences and predictions, and understand characters' intentions and desires
- **Narratives (written or verbal)** – providing narratives involves monitoring and maintaining the listener's attention, explaining characters' emotions, thoughts, and actions, and shifting between two characters' perspectives in the story

As you can no doubt see, deficits in theory of mind can have a cascading effect on an individual's social and academic life.

Helping young children tune-in to others

Many intervention ideas and approaches for promoting theory of mind are geared towards older children, such as video-modelling, cartoons, group discussion and role playing social situations. But there are also many ways we can promote the development of theory of mind in the younger children on our caseloads:

- **Establish engagement** – Westby et al (2014) suggest activities that involve ongoing emotional sharing during face-to-face interactions to encourage children to notice what others are doing and to draw others' attention to what they are doing themselves. They recommend following the child's lead by choosing activities and objects that the child enjoys, imitating the child's behaviour and helping the child imitate the adult's behaviour, and intruding if necessary into the child's focus. Starting to sound familiar? In *More Than Words®*, we refer to these strategies as "Include your child's interests", "Imitate" and "Intrude".

- **Target initiating and responding to joint attention** – these are separate skills that require separate intervention as working on one does not necessarily lead to improvements in the other (Westby et al, 2014). Westby et al (2014) cite the *More*

Than Words® program as a well-known intervention that focuses on promoting joint attention with young children.

- **Promote pretend play** – pretend play is considered to be a precursor to theory of mind (Westby et al, 2014). When children pretend, they have to tune-in to others' perspectives. And when children take on a role during pretend play, it encourages them to think about and re-enact the perspectives of the individual they are role playing.

- **Model "tuning-in language"** – mother-child conversations that contain frequent references to mental states have been shown to improve theory of mind task success in children with autism (Slaughter, Peterson, & Mackintosh, 2007). de Villiers et al (2014) therefore suggest "manipulating the language input to the child and engaging in interactive teaching of the language needed to talk about the mind" (p. 321). Modeling tuning-in language involves putting the child's feelings, wants, and perspectives into words (e.g. "Oh, you want a cookie" or "Don't worry, you thought I was gone, but I'm here!") (de Villiers et al, 2014). Explaining why other people do the things they do also helps build perspective taking (e.g. "Sally looks happy. She must really like her present").

- **Storybooks** – understanding the mental states of the characters is what allows a reader to make sense of most stories. For example, an understanding of false beliefs allows the reader to understand that Little Red Riding Hood believes that the wolf is really her grandmother. Talking about characters' thoughts and feelings, their differing ideas and reactions, and what characters might do next in the story helps promote early theory of mind. de Villiers et al (2014) point out that "research shows that for facilitating theory of mind development, it is important that the emotions, desires, and cognitions of the characters in the story not just be labeled but discussed and related to the experiences of the children being read to" (p. 323).

In conclusion...

In order to promote children's social communication skills, we really can't ignore their theory of mind development. Speech and language professionals don't always feel equipped to intervene in this area, and research about assessment and intervention is still in its infancy. However, there are several Hanen resources available to help you promote theory of mind development in young children, including:

- *TalkAbility*™– evidence-based intervention strategies related to the five stages of first-order theory of mind development, aimed at promoting the social and special language abilities necessary for conversations and friendships

- *Teaching Tuning In: Practical Strategies to Promote Theory of Mind for Verbal Children on the Autism Spectrum* – e-seminar about the development of theory of mind and interaction strategies for helping verbal children on the autism spectrum tune-in to others during everyday interactions and conversations
- Articles on the Hanen website
    1. articles for professionals – "Let's Pretend: The relationship between play and theory of mind in typical children and children with ASD"
    2. articles for parents – "The Truth About Kids' Lies" (describes how the ability to lie is related to theory of mind); " 'Tuning-in' to others: How young children develop theory of mind" (a summary of theory of mind development and tips for promoting tuning in)

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